TREE VISUALIZATION SYSTEM AND METHOD BASED UPON A COMPRESSED HALF-PLANE MODEL OF HYPERBOLIC GEOMETRY

ABSTRACT

[0194]   Methods and systems for browsing a node-link structure involves displaying representations of the node-link structure within a display area, which are well suited to utilization of display areas with a narrow rectangular shape. An animated view of the node-link structure is accomplished, which preserves focus and context for the user, and allows scrolling among related nodes. Thus, the node link data is used to present a sequence of representations of the node-link structure on a display. The display has an edge along one side acting as a horizon corresponding for example with the horizon of a hyperbolic space half-plane. The sequence begins with a first representation and ends with the last representation, perceptible as changed continuation of the first representation. Lower level node features that share a parent node feature have centers of area positioned on the display in order approximately along a line generally parallel with the horizon, with sufficiently similar spacings along an axis perpendicular to the horizon from the region around a parent node feature, and with sufficiently similar spacings in a dimension generally parallel to the horizon from adjacent node features along the line, that the lower level node features sharing the parent node feature are perceptible as a group of related node features. The half-plane model with compression is used for layout of the node-link data, by mapping the selected portion of the hyperbolic layout data to a Euclidean space according to a half-plane model to produce Euclidean layout data. The Euclidean layout data is compressed as positions approach the displayable boundaries at the side of the display area opposite to the horizon, and as positions approach the top and bottom sides orthogonal to the horizon, to yield the display layout data, so that additional context for upper level nodes in the node link structure is preserved.

G:\CLIENTS\Inxight\INXT 1010-1\applnasfiled.wpd